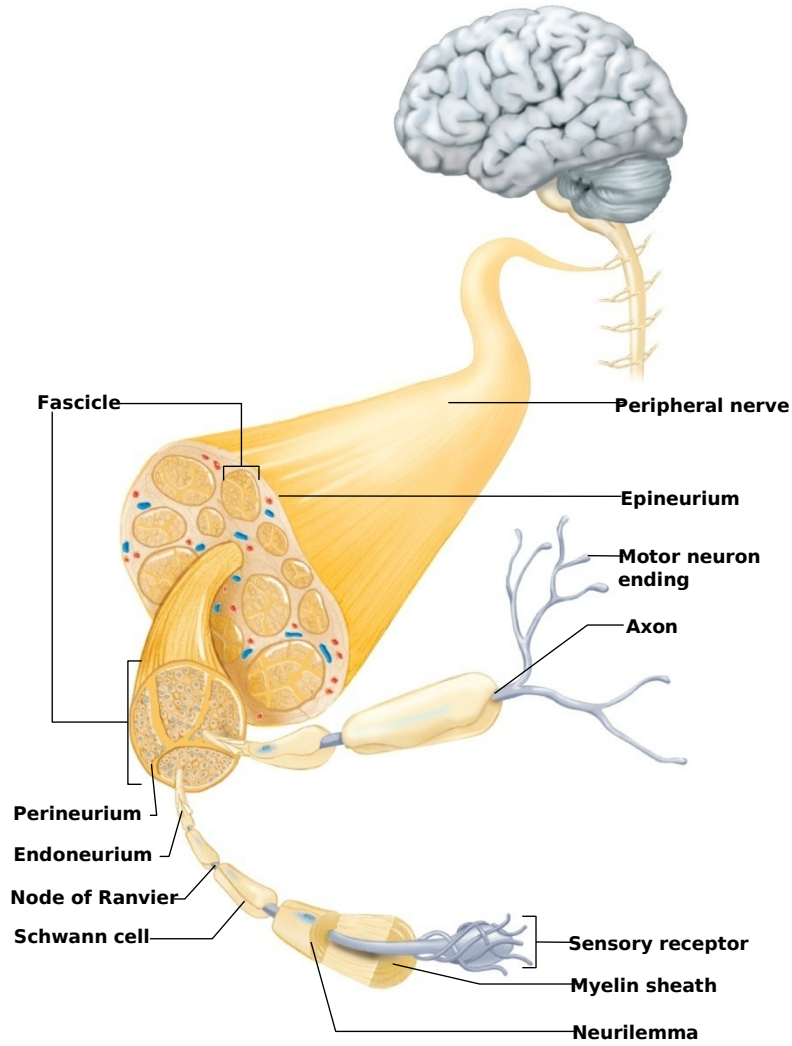


Structure of a Peripheral Nerve

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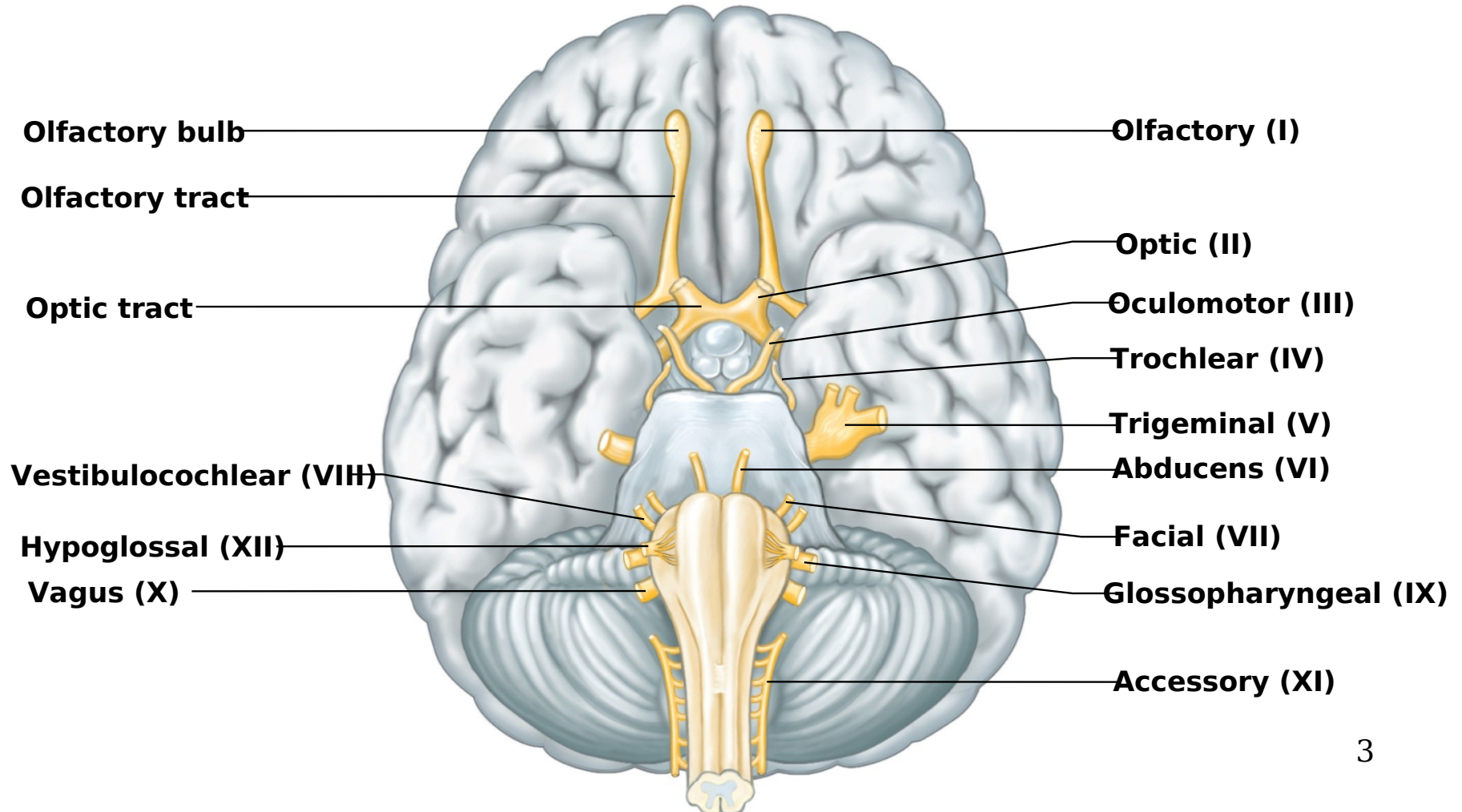


Nerve and Nerve Fiber Classification

- Sensory nerves
 - Conduct impulses into brain or spinal cord
- Motor nerves
 - Conduct impulses to muscles or glands
- Mixed (both sensory and motor) nerves
 - Contain both sensory nerve fibers and motor nerve fibers
 - Most nerves are mixed nerves
 - ALL spinal nerves are mixed nerves (except the first pair)

Cranial Nerves

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Cranial Nerves

- Remember:
 - Cranial nerves are designated 'C N'
 - Cranial nerves are designated with Roman numerals (I – XII)

Functions of Cranial Nerves

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TABLE 11.9 | Functions of Cranial Nerves

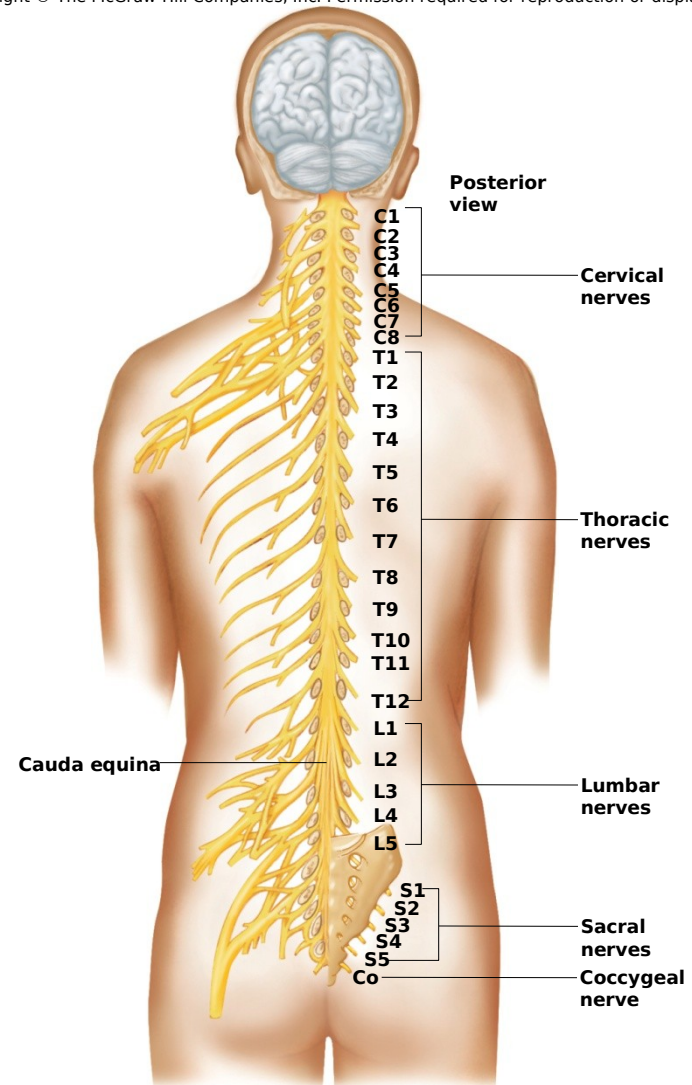
Nerve	Type	Function
I Olfactory	Sensory	Sensory fibers transmit impulses associated with the sense of smell.
II Optic	Sensory	Sensory fibers transmit impulses associated with the sense of vision.
III Oculomotor	Primarily motor	Motor fibers transmit impulses to muscles that raise the eyelids, move the eyes, adjust the amount of light entering the eyes, and focus the lenses. Some sensory fibers transmit impulses associated with proprioceptors.
IV Trochlear	Primarily motor	Motor fibers transmit impulses to muscles that move the eyes. Some sensory fibers transmit impulses associated with proprioceptors.
V Trigeminal	Mixed	
Ophthalmic division		Sensory fibers transmit impulses from the surface of the eyes, tear glands, scalp, forehead, and upper eyelids.
Maxillary division		Sensory fibers transmit impulses from the upper teeth, upper gum, upper lip, lining of the palate, and skin of the face.
Mandibular division		Sensory fibers transmit impulses from the scalp, skin of the jaw, lower teeth, lower gum, and lower lip. Motor fibers transmit impulses to muscles of mastication and to muscles in the floor of the mouth.
VI Abducens	Primarily motor	Motor fibers transmit impulses to muscles that move the eyes. Some sensory fibers transmit impulses associated with proprioceptors.
VII Facial	Mixed	Sensory fibers transmit impulses associated with taste receptors of the anterior tongue. Motor fibers transmit impulses to muscles of facial expression, tear glands, and salivary glands.
VIII Vestibulocochlear	Sensory	
Vestibular branch		Sensory fibers transmit impulses associated with the sense of equilibrium.
Cochlear branch		Sensory fibers transmit impulses associated with the sense of hearing.
IX Glossopharyngeal	Mixed	Sensory fibers transmit impulses from the pharynx, tonsils, posterior tongue, and carotid arteries. Motor fibers transmit impulses to salivary glands and to muscles of the pharynx used in swallowing.
X Vagus	Mixed	Somatic motor fibers transmit impulses to muscles associated with speech and swallowing; autonomic motor fibers transmit impulses to the viscera of the thorax and abdomen. Sensory fibers transmit impulses from the pharynx, larynx, esophagus, and viscera of the thorax and abdomen.
XI Accessory	Primarily motor	
Cranial branch		Motor fibers transmit impulses to muscles of the soft palate, pharynx, and larynx.
Spinal branch		Motor fibers transmit impulses to muscles of the neck and back; some proprioceptor input.
XII Hypoglossal	Primarily motor	Motor fibers transmit impulses to muscles that move the tongue; some proprioceptor input.

Spinal Nerves

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- ALL are mixed nerves (except the first pair)
- 31 pairs of spinal nerves:

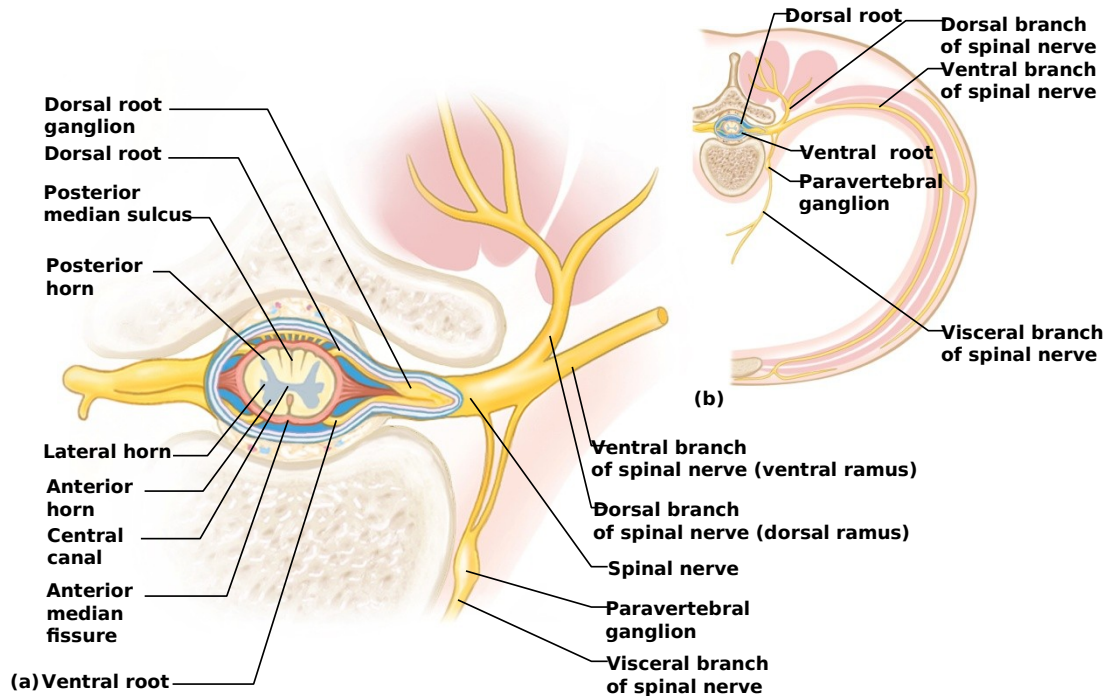
- 8 cervical nerves
 - (C1 to C8)
- 12 thoracic nerves
 - (T1 to T12)
- 5 lumbar nerves
 - (L1 to L5)
- 5 sacral nerves
 - (S1 to S5)
- 1 coccygeal nerve
 - (Co or Cc)



Spinal Nerves

- Dorsal root (aka posterior root)
 - Sensory root
 - Axons of sensory neurons are in the dorsal root ganglion
- Dorsal root ganglion
 - Aka DRG
 - Cell bodies of sensory neurons whose axons conduct impulses inward from peripheral body parts

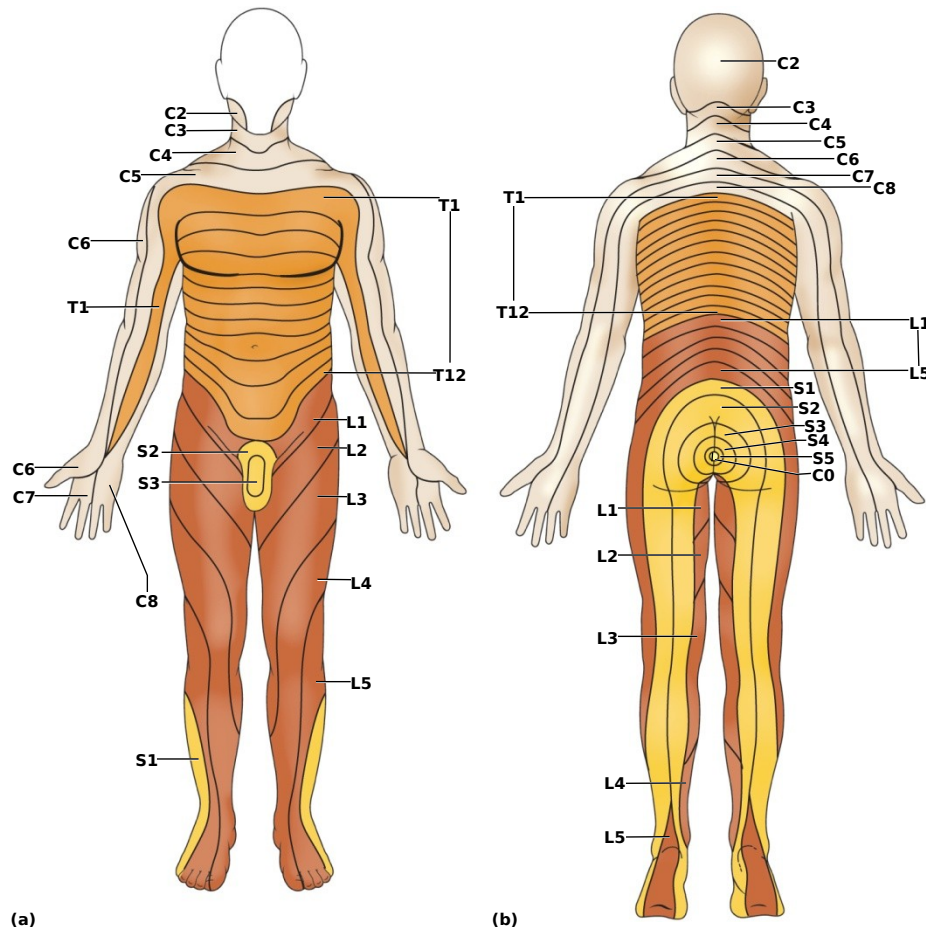
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Dermatome

- An area of skin that the sensory nerve fibers of a particular spinal nerve innervate

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Spinal Nerves

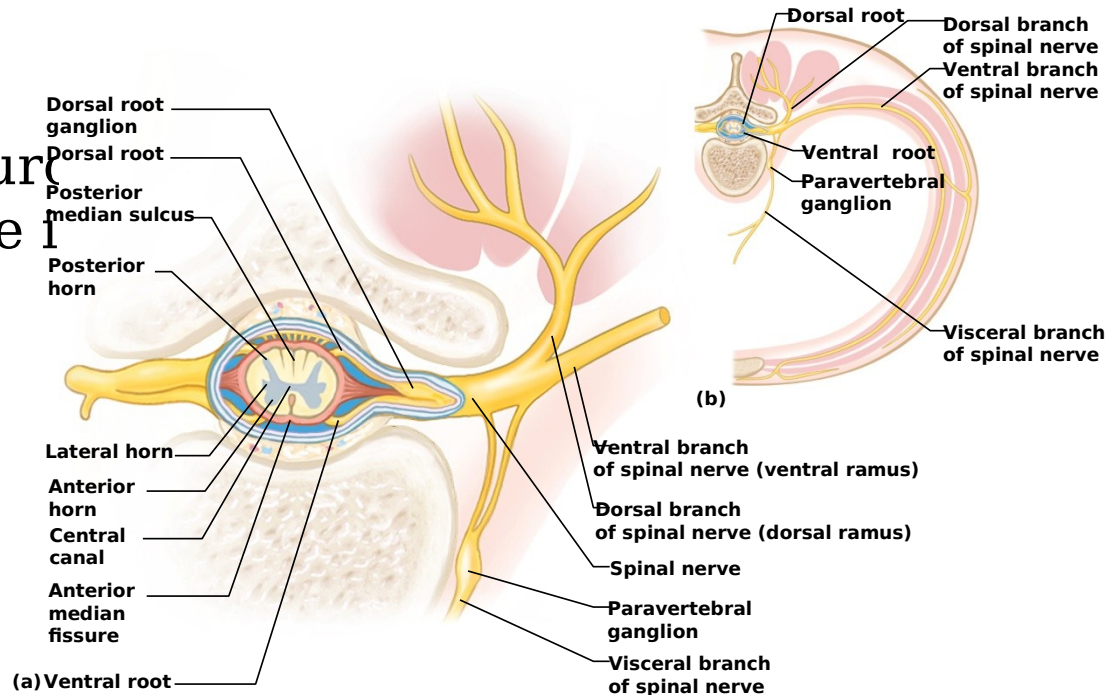
- **Ventral root** (aka **anterior root**)

- Motor root
- Axons of motor neurons whose cell bodies are in the spinal cord

- **Spinal nerve**

- Union of ventral root and dorsal roots
- Hence we now have a “mixed” nerve

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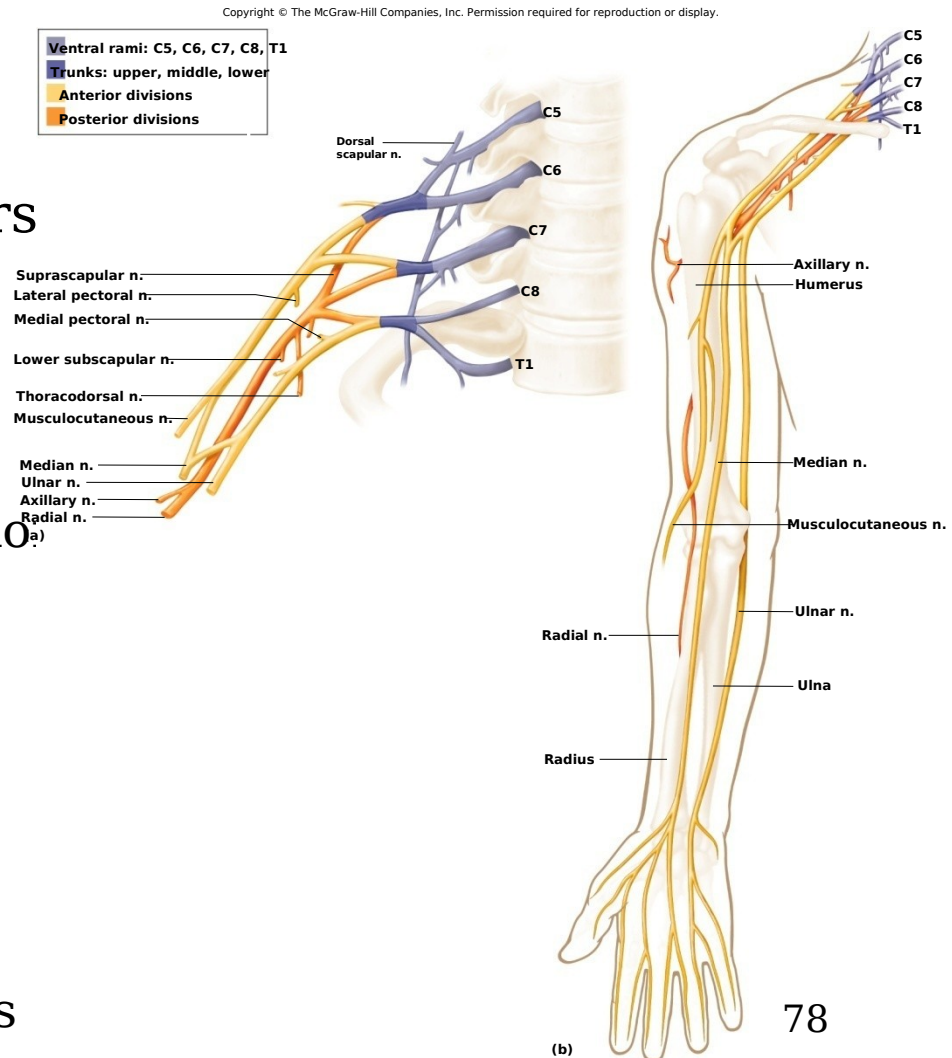
Nerve Plexuses

- Nerve plexus
 - Complex networks formed by anterior branches of spinal nerves
 - The fibers of various spinal nerves are sorted and recombined
- (1) Cervical plexus (3) nerve plexuses:
 - Formed by anterior branches of C1-C4 spinal nerves
 - Lies deep in the neck
 - Supply to muscles and skin of the neck
 - C3-C4-C5 nerve roots contribute to phrenic nerves bilaterally

Brachial Plexus

• (2) Brachial plexus

- Formed by anterior branches C5-T1
- Lies deep within shoulders
- There are five (5) branches:
 - 1. Musculocutaneous nerve
 - Supply muscles of anterior arms and skin of forearms
 - 2. Ulnar and 3. Median nerves
 - Supply muscles of forearms and hands
 - Supply skin of hands
 - 4. Radial nerve
 - Supply posterior muscles of arms and skin of



Lumbosacral Plexus

- (3) Lumbosacral plexus
 - Formed by the anterior branches of L1-S5 roots
 - Can be a lumbar (L1-L5) plexus and a sacral (S1-S5) plexus
 - Extends from lumbar region into pelvic cavity
 - Obturator nerve
 - Supply motor impulses to adductors of thighs
 - Femoral nerve
 - Supply motor impulses to muscles of anterior thigh and sensory impulses from skin of thighs and legs
 - Sciatic nerve

